UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,431	03/20/2001	Earl C. Herleikson	10991734-1	9848

38107 7590 07/11/2007

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
595 MINER ROAD
CLEVELAND, OH 44143

EXAMINER	
ODOM, CURTIS B	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
07/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/812,431	HERLEIKSON ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-5,7-11,17,18,20-22,24,27 and 28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-5, 7-11, 17, 18, 20-22, 24, 27, and 28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 4/23/2007 have been fully considered but they are not persuasive. Applicant states "**The Office Action points to nothing on the record that remotely suggests that the skilled artisan would consider "Golay codes" to be equivalent to "spread spectrum".**

Indeed, the cited portion of Chiao expressly contradicts this bald assertion, stating that the benefit of Golay sequences is that they increase the SNR without incurring undesirable range lobes. Such "undesirable range lobes" would constitute some sort of spreading of the spectrum - hence, Chiao itself teaches that Golay sequences do not spread the spectrum, and advocates the lack of such spectral spreading as an advantage of Golay sequences. A coding that produces a signal with extraneous lobes (that is, something other than a Golay sequence according to Chiao) would not necessarily be a spread spectrum signal, but at least would be in the direction of spreading the spectrum. The Golay sequences of Chiao do not even reach this level, but are instead expressly selected to avoid any spectral spreading.

Assertions of technical facts of specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. MPEP § 2144.03. It is never appropriate to rely solely on "common knowledge" in the art without evidentiary support in the record, as the principal evidence upon which a rejection

was based. Id. The unsupported equating of Chiao's "Golay coding" with "spread spectrum" is fundamental to the proposed basis of rejection, and cannot be properly made without providing evidentiary support. That Chiao teaches away from the relied-upon presumption heightens the discord between the Office Action's bald assertion and the teachings of Chiao."

However, it is still the understanding of the Examiner that the Golay codes of Chiao (U. S. Patent No. 6, 048, 315) are in fact spread spectrum codes. The fact the Golay sequences do not incur undesirable range lobes does not infer that the Golay codes are not spread spectrum sequences. Avoiding undesirable range lobes does not infer a signal is not spread across a spectrum. Thus, the Examiner does not agree that Chiao teaches away from spreading a signal across a spectrum. In fact, Chiao discloses using binary complementary pairs of Golay sequences to code a signal (see column 2, lines 55-61). Prior art reference "Spreading Sequences for Multicarrier CDMA Systems" by Branislav M. Popovic (IEEE Transactions on Communications, Vol. 47, No. 6, June 1999) discloses that Golay complementary sequences are spreading sequences with produce a spread spectrum (MC-SS) waveform with the crest factor always less than of equal to 6 dB (see page 922, column 1). Therefore, based on prior art, it is the understanding of the Examiner that Golay codes are in fact spread spectrum codes.

The Applicant further states "**The newly proposed combination is improper at least because Chiao teaches away from using a signal that is intentionally spread out. See MPEP §§ 2141.02, 2145. Moreover, the suggestion that increasing noise immunity provides motivation for substituting Gersheneld's (U. S. Patent No. 5, 914, 701) spread spectrum for the Golay coding used in the ultrasound of Chiao (Office Action at page 4) is rebutted**

because Chiao already teaches a satisfactory method of noise immunity via the Golay sequences. These Golay sequences increase the signal-to-noise ratio (thus enhancing noise immunity) without incurring spectral broadening in the form of undesirable range lobes. The proposed substitution of Gersheneld's spread spectrum for Chiao's Golay sequences would not enhance Chiao's noise immunity, and further would detrimentally introduce undesirable spectral broadening.

As explained above, the Examiner disagrees that Chiao teaches away from using a signal that is intentionally spread. Simply because Chiao teaches a method of noise immunity using the Golay sequences does not mean the teachings of Gersheneld can not be used to enhance the noise immunity of Chiao. Avoiding undesirable range lobes does not equate to spectral broadening (as explained above) and thus, the proposed combination of Chiao and Gersheneld is proper.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2-5, 10, 11, 17, 18, 20, 21, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao et al. (previously cited in Office Action 1/24/2007) in view of Gersheneld et al. (previously cited in Office Action 1/24/2007).

Regarding claim 2, Gersheneld states using electrodes to transmit the spread spectrum current signals into the body (see column 2, lines 8-19). It would have been obvious to include this feature since Gershenel states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Regarding claim 3, Gersheneld discloses transmitting current signals into the body (see column 2, lines 8-19) and detecting the signals by measuring potential (voltage), see column 5, lines 46-55). It would have been obvious to include this feature since Gershenel states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Regarding claim 4, Chiao discloses transmitting voltage signals into the body (see column 1, lines 28-44).

Regarding claim 5, Chiao discloses transmitting voltage signals into a body (see column 1, lines 28-44), but does not disclose measuring current signals from the voltages. However, Gersheneld discloses producing modulated spread spectrum signals that vary voltages between electrodes (see column 2, lines 8-19), wherein the spread spectrum signals are detected by measuring current (see column 4, lines 55-column 5, line 3). Therefore, it would have been obvious to transmit spread spectrum voltage signals in Chiao and measure spread spectrum current signals as disclosed by Gersheneld since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Regarding claim 10, Chiao discloses an ultrasound transducer (see column 1, lines 28-44) for transmitting ultrasound signals into the body.

Regarding claim 11, Chiao discloses analyzing the ultrasound signal to image the heart (determine heart rate), see column 2, lines 1-6.

Regarding claim 17, Chiao discloses a measurement device (see Fig. 4) for measuring a desired physiological condition (see column 1, lines 7-10, ultrasound imaging) of a patient while avoiding degradation using Golay codes (see column 2, lines 55-67) in an accuracy of the measured physiological conditions due to interference from nearby electronic equipment, the device comprising:

means (transducer) for transmitting (see column 1, lines 28-44 and column 4, lines 15-20) signals spread across a wide spectrum of frequencies into a patient's body;

means (receiving transducer element) for detecting reflected signals from the patient's body (column 1, lines 45-59 and column 4, lines 15-27) corresponding to the transmitted signals;

means for generating a measured parameter signal from a cross-correlation of the transmitted and detected echoed signals as described in column 5, line 44-column 6, line 9;

means for analyzing the measured parameter signal by producing an image (see column 1, lines 55-59 and column 8, lines 1-2) to measure the desired physiological condition.

Chiao does not specifically disclose the transmitted and detected signals are spread spectrum signals. However, Chiao does disclose the transmitted and detected signals are Golay coded (see column 2, lines 55-67), wherein Golay codes are known in the art as spread spectrum codes. Gersheneld further discloses transmitting spread spectrum signals into a patient's body using electrodes (see column 2, lines 8-19) and detecting the signals output from the patient's body (see column 2, lines 25-39). Gersheneld discloses the spread spectrum signals increase noise immunity (see column 2, lines 20-24). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to implement spread spectrum signals in the

device of Chiao as disclosed by Gersheneld since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Regarding claim 18, Chiao discloses measuring tissue (ultrasound) images (see column 2, lines 1-6).

Regarding claim 20, Chiao discloses a medical measurement device (see Fig. 4) for measuring comprising:

a transducer (see column 1, lines 28-44 and column 4, lines 15-20) contacting a medical patient;

the transducer transmitting a signal into the patient (see column 1, lines 28-44)

a signal detector (receiving transducer element) for detecting reflected signals from the patient's body (column 1, lines 45-59 and column 4, lines 15-27) and cross-correlating the transmitted and detected echoed signals (as described in column 5, line 44-column 6, line 9) to produce a measured parameter signal;

a signal processor for analyzing the measured parameter signal by producing an image (see column 1, lines 55-59 and column 8, lines 1-2) to determine a desired physiological condition of the patient.

Chiao does not specifically disclose the transmitted and detected signals are spread spectrum signals, wherein the spread spectrum signals are produced by a random signal generator and transmitted and detected through electrodes. However, Chiao does disclose the transmitted and detected signals are Golay coded (see column 2, lines 55-67), wherein Golay codes are known in the art as spread spectrum codes. Gersheneld further discloses transmitting spread spectrum signals into a patient's body using electrodes (see column 2, lines 8-19) and

detecting the signals output from the patient's body using electrodes (see column 2, lines 25-39). Gersheneld discloses the spread spectrum signals are produced using a pseudorandom code (see column 2, lines 20-24). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to implement spread spectrum signals in the device of Chiao as disclosed by Gersheneld since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Regarding claim 21, Chiao discloses transmitting ultrasound signals (see column 1, lines 28-44).

Regarding claim 27, Chiao discloses imaging the heart (for determining heart rate), see column 2, lines 1-6.

Regarding claim 28, Chiao discloses a physiological condition measurement device (see Fig. 4) for measuring comprising:

a transducer transmitting a signal into the patient (see column 1, lines 28-44)

a signal detector (receiving transducer element) for detecting reflected signals from the patient's body (column 1, lines 45-59 and column 4, lines 15-27) and cross-correlating the transmitted and detected echoed signals (as described in column 5, line 44-column 6, line 9) to produce a measured parameter signal;

a signal processor programmed to analyze the measured parameter signal by producing an image (see column 1, lines 55-59 and column 8, lines 1-2) to determine a desired physiological condition of the patient.

Chiao does not specifically disclose the transmitted and detected signals are spread spectrum signals, wherein the spread spectrum signals are produced by a random signal

generator. However, Chiao does disclose the transmitted and detected signals are Golay coded (see column 2, lines 55-67), wherein Golay codes are known in the art as spread spectrum codes. Gersheneld further discloses transmitting spread spectrum signals into a patient's body using electrodes (see column 2, lines 8-19) and detecting the ignals output from the patient's body using electrodes (see column 2, lines 25-39). Gersheneld discloses the spread spectrum signals are produced using a pseudorandom code (see column 2, lines 20-24). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to implement spread spectrum signals in the device of Chiao as disclosed by Gersheneld since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

4. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao et al. (previously cited in Office Action 1/24/2007) in view of Gersheneld et al. (previously cited in Office Action 1/24/2007) as applied to claim 17, and in further view of Nappholz et al. (previously cited in Office Action 8/13/2004).

Regarding claims 7-9, Gersheneld discloses transmitting spread spectrum signals via electrodes (se column 2, lines 8-19) and detecting (measuring) the spread spectrum signal (see column 4, line 55-column 5, line 3). It would have been obvious to include this feature since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24). However, Chiao and Gersheneld do not disclose generating an impedance signal from the measured signal and analyzing the impedance signal to determine a contact impedance which determines the heart rate or respiration rate of a patient.

Nappholz et al. discloses analyzing an impedance signal from electrodes to determine a heart rate of a patient (column 10, line 1-17). The electrodes are placed in the patient (see

column 3, lines 48-56) and contact impedances from the electrodes are measured to determine heart rate (see column 10, lines 1-5) and respiration rate (see column 4, lines 30-46). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method/device of Chiao and Gersheneld with the teachings of Nappholz et al. and place the electrodes in an arrangement to detect an impedance signal from the heart from which a heart rate and respiration rate can be determined to increase the overall functioning capacity and flexibility of the device and to allow the warning of physiological events (see Nappholz et al., column 1, lines 5-10).

5. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao et al. (previously cited in Office Action 1/24/2007) in view of Gersheneld et al. (previously cited in Office Action 1/24/2007) as applied to claim 28, and in further view of Kinast et al. (previously cited in Office Action 8/13/2004).

Regarding claim 22, Gersheneld discloses transmitting spread spectrum signals via electrodes (see column 2, lines 8-19) and detecting (measuring) the spread spectrum signal (see column 4, line 55-column 5, line 3). It would have been obvious to include this feature since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24). Chiao and Gerhseneld do not disclose the spread spectrum signal is a light signal.

However Kinast et al. discloses transmitting a light signal to a medium and analyzing the results of the signal propagation to determine the level of blood oxygen (column 7, lines 12-67). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the device of Chiao and Gersheneld with the teachings of Kinast et al. in order to

allow the device to also transmit spread spectrum light signals, in order to measure levels of blood oxygenation. (see Kinast et al., column 1, lines 5-8).

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiao et al. (previously cited in Office Action 1/24/2007) in view of Gersheneld et al. (previously cited in Office Action 1/24/2007) as applied to claim 17, and in further view of Abraham (previously cited in Office Action 3/29/2005).

Regarding claim 24, Gersheneld discloses transmitting spread spectrum signals via electrodes (see column 2, lines 8-19) and detecting (measuring) the spread spectrum signal (see column 4, line 55-column 5, line 3). It would have been obvious to include this feature since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24). Chiao and Gerhseneld do not disclose the transmitter contains means for generating a clock signal; means for generating random numbers; and means for dividing the clock signal by the generated random numbers to generate a randomized clock signal that is used in generating the spread spectrum signal.

However, Abraham discloses a known apparatus for generating a spread spectrum signal including a random signal generator for generating a clock signal that is used to spread a signal directed into a medium across a desired frequency by randomizing a clock signal with a random number generator and a divider (Fig. 18, column 18, lines 29-52). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the spread spectrum signal generation of Chiao and Gersheneld with the teachings of the spread spectrum generation of Abraham since Gersheneld states spread spectrum signals increase noise immunity (see column 2, lines 20-24).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Curtis Odom
July 8, 2007